ATTACHMENT 1

FACILITY DESCRIPTION

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LIST OF ACRONYMS

BCS	Bulk Chemical Storage
BRA	Brine Reduction Area
CAL	Chemical Assessment Laboratory
CAMDS	Chemical Agent Munitions Disposal System
CFR	Code of Federal Regulations
CHB	Container Handling Building
CSB	Communication Switch Building
CSDP	Chemical Stockpile Disposal Program
CWC	Chemical Weapons Convention
DCD	Deseret Chemical Depot
DFS	Deactivation Furnace System
ECF	Entry Control Facility
GB	Sarin, Isopropyl methylphosphonofluoridate
H/HD/HT	Sulfur Mustard[1] /Distilled Sulfur Mustard/Distilled Mustard with 40% Bis-[2-(2-chloroethylthio)-ethyl] ether
HVAC	Heating, Ventilation, Air Conditioning
JACADS	Johnston Atoll Chemical Agent Disposal System
LIC	Liquid Incinerator
LPG	Liquefied Petroleum Gas
MDB	Munitions Demilitarization Building
MSB	Monitor Support Building
MPF	Metal Parts Furnace
NDAA	National Defense Authorization Act
NFPA	National Fire Protection Association
OSIA	On Site Inspection Agency
PAS	Pollution Abatement System
PMB	Personnel Maintenance Building
PMCD	Program Manager for Chemical Demilitarization
POT	Potable Water System
PRW	Process Water System
PSB	Personnel Support Building
PUB	Process and Utility Building
SWMU	Solid Waste Management Unit
T	Bis-[2-(2-chloroethylthio)-ethyl] ether
TCB	Treaty Compliance Building
TMA	Toxic Maintenance Area
TOCDF	Tooele Chemical Agent Disposal Facility
UPA	Unpack Area
VX	O-ethyl-S-(2-diisopropylaminoethyl) methyl phosphonothiolate
WTS	Water Treatment System

[1] Sulfur Mustard = Bis(2-Chloroethyl) Sulfide or 2.2' Dichlorodiethyl Sulfide

1.1 GENERAL DESCRIPTION [R315-3-2.5(b)(1)]

1.1.1 Introduction

1.1.1.1 The Tooele Chemical Agent Disposal Facility (TOCDF) is a multi-incinerator hazardous waste treatment and storage facility located within the federally owned Deseret Chemical Depot (DCD).

1.1.1.2 The TOCDF is designed and constructed for the treatment of the chemical agents and munitions stockpile currently stored at the DCD Area 10 (a.k.a. Chemical Munitions Storage Area). Area 10 is immediately adjacent and physically connected to the northern end of the TOCDF.

1.1.2 Facility Location and Setting

1.1.2.1 DCD is located in the State of Utah and covers about 7,900 hectares and is located approximately 26 kilometers (16 miles) south of the City of Tooele, off State Highway 36 at latitude 40° 18' 00" North and longitude 112° 20' 00" West. DCD is located approximately 56 kilometers (35 miles) southwest of Salt Lake City, approximately 48 kilometers (30 miles) south of the Great Salt Lake, approximately 48 kilometers (30 miles) west of Utah Lake, and approximately 61 kilometers (38 miles) west of the city of Provo. Figure 1-1[2] shows the location of the DCD in the Rush Valley of Tooele County and its relation to the other towns, cities, and geographic landmarks in the area. The location of the TOCDF lies within the DCD installation boundaries as shown in Drawing TE-16-C-2.[3]

1.1.2.2 DCD is generally rectangular in shape: approximately 6.5 miles in length (east-west) and 5 miles in width (north-south) and comprises 19,364 acres. Several types of chemical agents are stored at DCD in a variety of ammunition configurations, including ton containers, projectiles and mortars. These munitions are stored in Area 10.

1.1.2.3 The processing area at the TOCDF, which is enclosed by a security fence, is comprised of approximately 40 acres. The distance from TOCDF demilitarization site to the nearest DCD boundary (due north) is approximately 2 miles.

1.1.2.4 There are five TOCDF-operated facilities, in addition to the TOCDF plant, on the DCD installation:

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1.1.2.4.1 The administration building located at 11600 Stark Road, approximately 3 miles northeast of the TOCDF. This building houses administrative offices only.

1.1.2.4.2 The Chemical Assessment Laboratory (CAL). This facility is located approximately 1.5 miles southwest of the TOCDF. The CAL has laboratory quantities of chemicals and neat and dilute solutions of chemical agents on location, but not in quantities sufficient to pose a danger to persons or the environment beyond the boundaries of the lab.

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[2] All figures are addressed at the end of this attachment.

[3] All drawings are addressed in Attachment 11.

1.1.2.4.3 The area known as Area 2 contains a number of warehouses. TOCDF controls eight of the warehouses in Area 2. These warehouses are used for storage of various items such as office furniture, tools, brick, product chemicals, and construction materials. Warehouses used by TOCDF are buildings 4001, 4002, 4012, 4057, 4058, 4108, 4109, and 4110. TOCDF may use other buildings for the storage of material and equipment. Area 2 is located approximately 2 miles east-southeast of the TOCDF.

1.1.2.4.4 The Transfer Yard is located approximately 1.5 miles east/northeast of the TOCDF.

1.1.2.4.5 Storage Igloos 1632 and 1634 are located within DCD Area 10 which is immediately adjacent to and physically connected to TOCDF. The balance of Area 10 is permitted under a separate Part B RCRA permit administered by DCD.

1.1.3 **Chemical Weapons Destruction Program Overview**

1.1.3.1 The U.S. Army maintains a stockpile of chemical agents and munitions for the Department of Defense. This stockpile was established to deter other countries from using chemical weapons on U.S. or allied troops. In 1968, the U.S. stopped manufacturing chemical weapons. The stockpile is no longer deemed necessary for national security.

1.1.3.2 In November 1985, the U.S. Congress approved the Department of Defense Authorization Act (Public Law 99-145) which directed and authorized the destruction of 90 % of the total U.S. stockpile of unitary chemical munitions and agents by 30 September 1994.

1.1.3.3 The Act was first amended on 15 March 1988 when the Army submitted the Chemical Stockpile Disposal Program (CSDP) implementation plan to Congress in which the deadline for destruction of the unitary chemical weapons stockpile was extended to 30 April 1997. This amendment also allowed more full-scale testing of the Johnston Atoll Chemical Agent Disposal System (JACADS) facility.

1.1.3.4 On 28 October 1992, the National Defense Authorization Act (NDAA) for fiscal year 1993 directed the Army to dispose of the entire unitary chemical weapons stockpile by 31 December 2004. The NDAA supersedes Public Law 99-145.

1.1.3.5 In April 1997, the Chemical Weapons Convention (CWC) was ratified by the United States and supersedes the NDAA. The CWC indicates that destruction of the unitary chemical weapons stockpile must be complete not later than 10 years after entry into force of this Convention (i.e., the year April 2007).

1.1.3.6 Chemical weapons are stored at eight separate sites throughout the continental United States, including the DCD.[4] At the beginning of agent destruction activities in 1996, DCD had the largest portion of the nation's chemical agent stockpile. Table 1-1 shows the makeup of the original stockpile that was to be destroyed at TOCDF.

[4] The seven other sites are: Pine Bluff Chemical Activity, Arkansas; Anniston Chemical Activity, Alabama; Umatilla Chemical Depot, Oregon; Newport Chemical Depot, Indiana; Edgewood Chemical Activity (Aberdeen Proving Ground), Maryland; Blue Grass Chemical Activity, Kentucky; and Pueblo Chemical Depot, Colorado.

Table 1-1
ORIGINAL STOCKPILE OF CHEMICAL WEAPONS
TO BE DESTROYED AT TOCDF

Agent	Item	Quantity[5]	Pounds[5]
HT-Blister	4.2" Mortars	62,590	363,020
HD-Blister	4.2" Mortars	976	5,860
	Ton Containers	6,398	11,383,420
H-Blister	155mm Projectiles	54,663	639,540
GB-Nerve	105mm Cartridges	119,400	194,620
	105mm Projectiles	679,303	1,107,260
	M55 Rockets	28,945	309,720
	M56 Rocket Warheads	1,066	11,406
	155mm Projectiles	89,141	579,417
	MK-116 Bombs	888	308,140
	MC-1 Bombs	4,463	981,860
	Ton Containers	5,709	8,598,200
VX-Nerve	155mm Projectiles	53,216	319,300
	M23 Land Mines	22,690	238,240
	M55 Rockets	3,966	39,660
	M56 Rocket Warheads	3,560	35,600
	TMU-28 Spray Tanks	862	1,168,880
	Ton Containers	640	910,960

1.1.3.7 The DCD stockpile of chemical agents includes organophosphate nerve agents and blister agents as listed below:

1.1.3.7.1 nerve agent VX

1.1.3.7.2 nerve agent Sarin (GB)

1.1.3.7.3 blister agents mustard (H, HD, and HT).

1.1.3.8 Information on chemical agent characteristics are briefly described in Table 1-2.

[5] The Army's Chemical Stockpile Disposal Program began destroying the chemical stockpile at the TOCDF in August 1996. These numbers do not reflect chemical weapons destroyed since operations began. As of June 2005, all bulk containers and munitions containing VX and GB nerve agents have been eliminated from the stockpile.

Table 1-2
CHEMICAL AGENTS TO BE DESTROYED AT TOCDF

Agent	Description
GB	GB (Sarin) is a rapid-acting nerve agent. The action within the body is the inactivation of cholinesterase. The hazard from GB is that of vapor absorption through the respiratory tract, although it can be absorbed through any part of the skin, through the eyes, and through the gastrointestinal tract by ingestion. The agent absorption rate is accelerated through cuts and abrasions in the skin. When dispersed as large droplets, GB is moderately persistent; it is nonpersistent when disseminated as a cloud of very fine particles.
VX	VX is a rapid-acting nerve agent. The action within the body is the inactivation of cholinesterase. The hazard from VX is primarily that of liquid absorption through the skin, although it can be absorbed through the respiratory tract as a vapor or aerosol, and through the gastrointestinal tract by ingestion. VX is slow to evaporate and may persist as a liquid for several days.
Mustard	Mustard is a persistent and powerful blister agent. It acts principally by poisoning the cells in the surfaces contacted. Both liquid and vapor cause intense inflammation and may cause severe blistering of both the skin and mucous membranes. Mustard is only moderately volatile. Mustard is designated H, HD, and HT. H is mustard made by the Levinstein process. It contains up to 25 percent by weight of impurities, chiefly sulfur, organosulfur, and polysulfides. HD (distilled mustard) is mustard purified by washing and vacuum distillation, which reduces the impurities to about 5 percent. HT is a 60:40 mixture by weight of HD and T. T is an abbreviation for Bis-[2-(2-chloroethylthio)-ethyl] ether.

1.1.3.9 The chemical agents are stored at the DCD Area 10.[6] The chemical agents are contained in mortars, artillery projectiles, and ton containers. Information on the munitions and bulk items is summarized in Table 1-3.

[6] Area 10, with the exception of Igloos 1632 and 1634, is permitted under a separate part B permit and administered by DCD.

Table 1-3
COMPOSITION OF MUNITIONS AND BULK ITEMS

Munition	Agent	Fuse	Burster	Propellant	Dunnage
4.2 in. mortars	HD, HT	Yes	Yes	Yes	Yes
155-mm projectiles	H	No	Yes[7]	No	Yes
Ton Containers	H, HD	No	No	No	No

1.1.4 **Chemical Agent Demilitarization Process Overview**

1.1.4.1 The TOCDF system involves reverse assembly of chemical agent-filled munitions and includes four incinerators for agent destruction.

1.1.4.2 Figure 1-2 presents a simplified flow diagram of the incineration treatment processes followed at the TOCDF. The treatment processes are based on the destruction of chemical agents and energetic materials by incineration. The primary processes employed at the plant and simplified TOCDF layout is briefly discussed below.

1.1.4.3 Munitions Processing

1.1.4.3.1 The munitions processing at the TOCDF includes initial separation of explosives and draining of the chemical agent. The Deactivation Furnace System (DFS) processes explosives removed from mortars, and projectiles. The Metal Parts Furnace (MPF) thermally decontaminates all drained bulk items, projectiles, and mortars from which the energetic components have been removed.

1.1.4.4 Agent Processing

1.1.4.4.1 The drained chemical agent mustard from bulk items and munitions is burned in the Liquid Incinerators (LICs), along with spent decontamination solution and miscellaneous waste liquids.

1.1.4.5 Pollution Abatement System

1.1.4.5.1 The flue gases from the DFS, MPF, and LICs are treated via separate wet Pollution Abatement Systems (PAS). The scrubber liquid (brine) from the wet scrubbers is pumped to storage tanks and transported off site for treatment and disposal.

1.1.4.6 Plant Operation

1.1.4.6.1 The TOCDF is operated 24 hours per day, 7 days per week, and 52 weeks per year. Personnel are at the site at all times.

1.1.5 **Hazardous Waste Disposal/Generation**

[7] While the majority of these items contain bursters, some are stored without these components.

1.1.5.1 Chemical Agents and Munitions

1.1.5.1.1 When the munitions or bulk agents are delivered to the TOCDF from Area 10, the physical and accounting responsibility is transferred from the storage account managed by the DCD commander to a demilitarization account managed by the TOCDF Site Project Manager, and the items are removed from the Army's inventory of chemical munitions. At this point, all bulk items and munitions will be classified as a hazardous waste. Agents GB, VX, and mustard agent are classified as a hazardous waste by the State of Utah.

1.1.5.2 Potentially Hazardous Wastes Generated at the TOCDF

1.1.5.2.1 In addition to chemical agent and munition wastes, there are potentially hazardous wastes generated during TOCDF operations that may require either interim storage, further on-site treatment, or shipment off site to an approved hazardous waste management facility. Waste streams generated at the TOCDF are described in detail in the Attachment 2 (Waste Analysis Plan). These wastes include but are not limited to:

1.1.5.2.1.1 The brine generated from the incinerator pollution abatement system.

1.1.5.2.1.2 Reserved.

1.1.5.2.1.3 Dry residues and ash collected from the DFS.

1.1.5.2.1.4 Ash from the operation of the MPF.

1.1.5.2.1.5 Ventilation system filters.

1.1.5.2.1.6 Monitoring support and laboratory wastes generated from onsite chemical analysis.

1.1.5.2.1.7 Spent Decontamination Solution.

1.1.5.3 RCRA Hazardous Waste Treatment and Storage Units that are Permitted

1.1.5.3.1 The hazardous waste management (process) systems consist of Container Storage, Tank Storage, Treatment in Tanks, Liquid Injection Incineration, Rotary Kiln Incineration, Multiple Hearth Incineration, Treatment In and Using Miscellaneous Treatment Units. Treatment codes are referenced in R315-50-2.

1.1.5.3.2 The incinerators are classified as hazardous waste incinerators because they are enclosed devices that use controlled flame combustion to thermally break down hazardous waste. The containers hold explosives, propellants, the various agents (e.g., ton containers and other items of equipment that contain these materials), and brine salts and dry residues from combustion. The storage of chemical agents, explosives, and propellants in the munitions and bulk items are addressed as container storage with regard to the hazardous waste regulations.

1.1.5.3.3 Chemical and physical characteristics of the chemical agents and explosives are described in the Attachment 2 (Waste Analysis Plan). Tanks hold agent, spent decontamination solution, brine, and miscellaneous liquids listed in Module IV.

1.2 TOPOGRAPHIC MAP [R315-3-2.5(b)(19)]

1.2.1 General

1.2.1.1 The following drawings and figures are used to satisfy specific facility description requirements:

1.2.1.1.1	TE-16-C-2	Overall Site Plan & Vicinity Map
1.2.1.1.2	TE-16-C-3	Topographic Map (restricted access - protected record)
1.2.1.1.3	TE-16-C-4	Site Work Area 1 Plot Plan
1.2.1.1.4	TE-16-C-5	Site Work Area 2 Plot Plan
1.2.1.1.5	TE-16-C-6	Site Work Area 3 Plot Plan
1.2.1.1.6	EG-16-C-7402	Site Work Storm Drain Plan
1.2.1.1.7	TE-22-C-10	Sewage Lagoon Site & Grading Plan
1.2.1.1.8	TE-22-C-13	Reservoir Site and Grading Plan
1.2.1.1.9	Figure 1-1	Location of Deseret Chemical Depot
1.2.1.1.10	Figure 1-3	Approximate Groundwater Monitor Well Location

1.2.1.2 Drawing TE-16-C-3 (restricted access - protected record) is a Topographic Map of the TOCDF site and includes the local surrounding area to a distance of at least 1,000 feet from the site perimeter. Map scale is 1 inch equals 100 feet and the contour interval is 5 feet.

1.2.2 Map Scale and Date

1.2.2.1 The current revision and date of each drawing is indicated in the lower right-hand title block. The current date of each drawing is indicated in the lower right-hand corner. Likewise the scale of each map is shown.

1.2.2.2 Drawings TE-16-C-2 and TE-16-C-3 are drawn to a scale of 1 inch equals 100 feet. The DCD portion of Drawing TE-16-C-3 is drawn to a scale of 1-inch equals 2500 feet.

1.2.3 100-Year Flood Plain

1.2.3.1 The DCD has not been mapped for the National Flood Insurance Program and thus there are no 100-year floodplain maps for the installation. The floodplain standard is discussed in further detail in section 1.3.2.

1.2.4 Surface Waters

1.2.4.1 The TOCDF site at the DCD is located at an elevation (approximately 5170 feet)[8] overlooking a relatively flat and arid lowland basin known as Rush Valley. The TOCDF buildings are approximately 140 feet higher in elevation than the valley floor and more than 7,000 feet horizontally distant.[9]

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[8] Precise TOCDF site brass cap monument elevation markers are indicated on Drawings TE-16-C-5 and TE-16-C-6.

[9] The brass cap monument markers located on the commercial railway due west of the TOCDF indicate an elevation of 5030 feet. (United States Geological Survey, Saint John

1.2.4.2 Water-related features pertinent to the TOCDF site are minor in importance, primarily because of their absence. Surface waters in Rush Valley include Rush Lake, Faust Creek and Reservoir, Vernon Creek and Reservoir, Ophir Creek, Clover Creek, and shallow ponds east of the town of Rush Valley. Several seasonal small streams, which originate in the Oquirrh, Stansbury, Onaqui, Tintic, and Sheeprock Mountains, disappear on the dry Rush Valley floor. No surface waters leave the valley. Runoff in Tooele Valley, which lies north of Rush Valley, drains to the northwest and into the Great Salt Lake. Most groundwater recharge occurs through infiltration of precipitation in the mountains, and to a lesser degree, from stream recharge and irrigation. The topography of the drainage basin is generally smooth and uniform, sloping to the west from the TOCDF to the Rush Valley floor. The valley floor drains to Rush Lake, which is located approximately 11 miles northwest from the TOCDF.[10]

1.2.4.3 The 460-square mile Rush Valley drainage basin is characterized as having poorly drained alkaline soils of moderately consolidated and unconsolidated layers of sand, gravel, silt, and clay.[11] Nevertheless, floods do not occur because of the arid climate and the storm water drainage system installed at the TOCDF. The lack of intermittent streams or defined flow paths in the valley confirms the lack of flooding potential. The elevation of the TOCDF above the valley floor further protects it from flood threats.

1.2.5 **Surrounding Land Uses**

1.2.5.1 The location of the TOCDF within the DCD installation boundaries is shown on Drawing TE-16-C-2. Also located on DCD property are the Chemical Agent Munitions Disposal System (CAMDS) facility, the CAL and associated TOCDF operated facilities described in 1.1.2.3. DCD (except Igloos 1632 and 1634) and the CAMDS facility operate separately and independently of the TOCDF and are not addressed in this document, whereas the CAL plays an integral part in TOCDF demilitarization operations. DCD also oversees other activities that relate to the overall operation of the Depot. Other areas within DCD are open range and are controlled by the military. The majority of the land surrounding DCD is likewise federally owned.

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1.2.5.2 Much of the 6,919 square mile Tooele County, where DCD is located, is sparsely populated. DCD was constructed in 1942 in Rush Valley. Originally, DCD was a

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Quadrangle, edited 1993).

[10] The elevation of Rush Lake is estimated to be approximately 5000 feet. See Figure 1-1 for the location of Rush Lake and mountain ranges.

[11] The Rush Valley is an elongated, north-south oriented, intermountain basin located between the Oquirrh Mountains to the east, the Stansbury and Onaqui Mountains to the west, and the Shiprock Mountains to the south. Rush Valley is located in the eastern Basin and Range physiographic province and is representative of intermountain basins within the province. Rush Valley is partially filled with alluvial sediments and lake beds. Geologic formations in the vicinity consist of Paleozoic sedimentary rock, along with gravel, sand, and clay. The TOCDF is located near the base of the Oquirrh Mountains, where the land surface consists of relatively porous colluvial and alluvial deposits containing sand and gravel, with some conglomerate and clay.

relatively remote area, accessible only by a railroad that was used for collection and distribution of munitions. Access to Rush Valley is possible on State Highway 36 from the north and State Highway 73 from the east.

1.2.5.3 Year 2000 population figures estimate the population for all of Tooele County at approximately 40,000. Presently, the majority of the county's population is concentrated north of the South Mountain geologic land formation, which separates Rush Valley from Tooele Valley.[12]

1.2.5.4 A few small communities, including Stockton, Rush Valley, and Ophir, ranches, and mines are located between a 10-kilometer to 25-kilometer (6-mile to 15-mile) radius of the TOCDF. No city or town lies within 10 kilometers (6 miles) of the TOCDF.

1.2.5.5 Land use outside the DCD is dominated by livestock grazing. Beef cattle lead as the primary livestock, followed by sheep.

1.2.5.6 Cropland accounts for only a minute fraction of the agricultural land use around DCD. Only 2.9% of the Rush Valley Basin has been cultivated for growing crops. Crops grown in the area include wheat, barley, corn, oats, and alfalfa. Since rainfall in the valley is limited, irrigation is a common practice among the agricultural sector. Water is obtained from nearby streams and water storage reservoirs.

1.2.6 **Wind Rose**

1.2.6.1 The wind rose for the TOCDF is included on Drawing TE-16-C-3 (restricted access - protected record). The wind rose plot is from data collected at the DCD weather station located in Building 5108 and reflects 1997-year end data from Weather Station 9. The prevailing winds at the TOCDF area follow the orientation of the mountain ranges flanking either side of the facility.[13] Winds are prevalent from the south through southeast in the summer and from the north through northwest in the winter.

1.2.7 **Map Orientation**

1.2.7.1 All drawings referenced in Paragraph 1.2.1 have a north arrow direction indicator.

1.2.8 **Legal Boundaries of the Facility**

1.2.8.1 Drawing TE-16-C-2 shows the legal boundaries of the TOCDF. The legal boundaries of the TOCDF are defined as the area enclosed by the outer security fence and the portion of the existing fence along Heart Street that connects the TOCDF to Area 10 perimeter fence. The only waste management units in the immediate vicinity of the TOCDF plant are those units located at the facility itself and Igloos 1632 and 1634 within DCD Area 10, located adjacent to and connected with TOCDF.

[12] Year-end population estimates are as provided by Utah Department of Workforce Services.

[13] As shown in Figure 1-1, the Oquirrh Mountains lie to the east and the Onaqui and Stansbury Mountains to the west of the TOCDF.

1.2.9 **Access Control**

1.2.9.1 Access to the DCD is via County Road 198, connecting State Highway 73 to the Main (North) Gate, and via State Highway 73 directly connecting to the Doolittle Road and the East Gate.

1.2.9.2 Entry to the TOCDF is controlled through the Entry Control Facility (ECF) located at the southern end of the facility. Attachment 4 (Security) provides a detailed narrative describing the security measures that are in place at the TOCDF and how access is controlled. All personal vehicles are parked outside of the TOCDF and do not impact the traffic within the fence.

1.2.9.3 Generally, all traffic (including government vehicles, commercial carriers, and privately owned vehicles) follows the primary traffic route. Only security vehicles, conventional-munitions transportation vehicles, and maintenance vehicles travel off of the primary route.

1.2.9.4 As shown in Drawing TE-16-C-2, the TOCDF is immediately adjacent to and physically connected to Area 10, and therefore, the area becomes a contiguous restricted area. Consequently, there are no over-the-road transport or demilitarization items outside of this area.

1.2.10 **Local Well Information and Groundwater Conditions**

1.2.10.1 There are no injection or withdrawal wells located at the TOCDF. Figure 1-3 shows the approximate locations of six groundwater monitoring wells found near the TOCDF sewage lagoon.

1.2.10.2 Groundwater occurs in three distinct aquifers in Rush Valley. The most extensive aquifer is the basin-fill aquifer. The overlying, relatively impermeable, clay-sized lacustrine sediments confine this aquifer, and restrict hydraulic communication between it and the playa surfaces. The sand and gravel of the alluvial fans along the flanks of the mountains compose the second alluvial-fan aquifer. The highest quality groundwater obtainable in Rush Valley is contained in this aquifer. The third is an unconfined, shallow-brine aquifer, which lies just below the valley surface. Groundwater quality in the Rush Valley ranges from fresh to briny.

1.2.10.3 Recharge to Rush Valley is almost entirely provided by rainfall and snow melt from the surrounding mountains. The basin-fill aquifer is recharged by subsurface inflow from adjacent alluvial fans and underlying Tertiary or Paleozoic rocks.

1.2.10.4 A southwest-to-northwest trending groundwater divide, which passes through the DCD, separates the flow of groundwater in Rush Valley into two distinct regions. Precipitation entering the ground water beneath the TOCDF can flow either toward South Mountain or the Thorpe Hills, depending upon which side of the divide they enter the aquifer.

1.2.11 **Buildings/Structures**

1.2.11.1 Drawing TE-16-C-2 shows all existing buildings, roads, railroads and fences in the vicinity of the TOCDF. Major buildings/structures located inside the TOCDF security

fence include the following: Container Handling Building (CHB); Entry Control Facility (ECF); Monitor Support Building (MSB); Treaty Compliance Building (TCB); Pollution Abatement System (PAS); Personnel Maintenance Building (PMB); Process and Utility Building (PUB); Various craft shops and supply warehouses; Brine Reduction Area Pollution Abatement System (BRA PAS); Heating, Ventilation, Air Conditioning (HVAC) Filters; and Munitions Demilitarization Building (MDB).

1.2.11.2 Major components of the MDB include the following: Deactivation Furnace System (DFS); Metal Parts Furnace (MPF); Two Liquid Incinerators (LICs); Control Room; and various disassembly and support areas essential for processing the full range of the DCD's unitary stockpile of agents and munitions.

1.2.11.3 Major buildings/structures located outside the TOCDF security fence include the following: Chemical Assessment Laboratory (CAL); Communication Switch Building (CSB); Personnel Support Building (PSB); On-Site Inspection Agency (OSIA); Warehouse Buildings S-7 and S-8, and Area 10 Igloos 1632 & 1634 which lie within the Area 10 security fence.

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1.2.12 **Sewers (Storm, Sanitary, Process)**

1.2.12.1 There are no sanitary or process sewage systems within the 1,000-foot radius of the TOCDF, other than the one constructed for the TOCDF. Location of the TOCDF Sewage Lagoon is shown on Drawing TE-22-C-10.

1.2.13 **Loading/Unloading Areas**

1.2.13.1 The chemical agents stored at the DCD Area 10 are stored in mortars, artillery projectiles, and ton containers. The munitions or bulk containers are loaded into overpacks in Area 10, placed on specialized trucks, and taken to the CHB.[14] The overpacks are moved from the CHB by conveyor to the Unpack Area (UPA) of the MDB. At the UPA, the air inside the overpack is monitored for agent, which would indicate a leaking container.

1.2.13.2 A second unload area involves the transfer of fuel and bulk chemicals from trucks to the Bulk Chemical Storage (BCS) facilities and Liquefied Petroleum Gas (LPG) tank.[15] The BCS facilities house the concentrated chemical solutions from which the decontamination, caustic wash, and neutralization solutions are made. The bulk chemicals are sodium hydroxide (18% by weight) and sodium hypochlorite (12% or less by weight). LPG and each bulk chemical have its own storage tank or tanks, its own supply pumps, and its own distribution system. Tanker trucks supply the feedstock for the bulk chemicals or LPG. The trucks supply the TOCDF with bulk chemical stock solutions in the concentrations shown above.

1.2.14 **Fire Control Facilities**

[14] See Drawing TE-16-C-5.

[15] See Drawing TE-16-C-4.

1.2.14.1 The MDB interior fire systems are designed to meet National Fire Protection Association (NFPA) standards. The fire water storage requirement is 330,000 gallons. Portable fire extinguishers, a sprinkler system, dry chemical systems, Halon system, and FM-200/FE-227 system are all built into the facility to minimize the threat of fire.

1.2.14.2 Water for the TOCDF is pumped from two wells located north of Stark Road (approximately 2 $^{1}/_{4}$ miles northeast of the TOCDF).[16] Pumps are installed at the existing DCD withdrawal wells to produce the anticipated 616,000 gallons per day required at DCD. The DCD withdrawal wells are located east-northeast of the TOCDF and more than 5 miles distant. The well pumps supply water to the two existing reservoirs (with a combined capacity of 1 million gallons). These reservoirs supply the existing water distribution system at DCD. The water main is capable of supplying a 500,000-gallon Firewater Tank[17] that may be used to augment the water supply from the two DCD reservoirs. This tank has been sized to provide for 12 hours of operation at the TOCDF and the fire water requirement of 330,000 gallons in lieu of the DCD water supply. The pump is provided at the Firewater Tank to meet fire flow demands. All Firewater Tank system components are designed to meet NFPA standards.

1.2.14.3 The water is chlorinated at the wellhead and then moves to the 500,000 gallon Firewater Tank if the tank is in use. The tank is located approximately 4,000 feet northeast of the TOCDF site. The water flows directly to the TOCDF past the Firewater Tank during periods of high demand and refills the tank during periods of low demand. When the water demand for the site exceeds the flow capacity of the wells, water flows out of the Firewater Tank, and a Firewater Pump just downstream of the tank increases the flow and pressure as needed. A pipe carries water from the Firewater Tank to the TOCDF. A pipe loop around the TOCDF supplies fire-fighting water to the site and to the fire-fighting systems in the CHB, PMB, and MDB. A pipe from this loop supplies water for the Water Treatment System (WTS, located in the PMB). Softened water from the WTS feeds the Potable Water System (POT) and Process Water Systems (PRW).

1.2.15 **Flood Control and Drainage Barriers**

1.2.15.1 Drawings TE-16-C-2 and TE-16-C-3 are topographic maps of the TOCDF and the local surrounding area. (**Note:** TE-16-C-3 is considered “restricted access – protected record.”) Drainage from the facility is westerly. The overall drainage gradient for the TOCDF is 1% or greater. The topography is generally smooth and uniform, allowing no chance for ponding or pooling of runoff waters. Natural drainage channels exist and do not direct water onto the facility.

1.2.15.2 The TOCDF covers approximately 40 acres and is largely covered by dirt, gravel, and impermeable surfaces (for example, buildings, asphalt, and concrete paving). Runoff from the TOCDF is controlled by the slope of the asphalt and concrete pavement and is directed towards storm drains, ditches, and culverts within the TOCDF. All on-site surface runoff is collected in an underground drainage system and routed to the storm drain detention

[16] See Drawing TE-16-C-2.

[17] See Drawing TE-22-C-13.

pond.[18] The pond is sized for the 100-year storm. Temperatures as well as types and amounts of precipitation are discussed in paragraph 1.2.15.3 below. No surface waters are used as public water supplies in the immediate vicinity of TOCDF. Surface water is used primarily for agricultural purposes in Rush Valley.

1.2.15.3 The climate of the TOCDF is characterized as dry continental and is heavily influenced by the mountains surrounding the facility. Temperatures are frequently above 32°C (90°F). High temperatures of 37°C (100°F) and low temperatures of -17°C (0°F) occur. The area is noted for plentiful sunshine, low relative humidity, and light precipitation. Annual rainfall varies between 25-30 centimeters (10-12 inches), distributed primarily from mid-fall through late spring. April is the wettest month, with an average of 2.00 inches of rain. July is the driest month, with an average of 0.64 inches. Snow averages 40 inches per year, with the maximum (13.2 inches average) in January, and snowfall greater than 1 inch during each month from October through April.

1.2.15.4 There is minimal tornado exposure (no known touchdowns in the valley since 1984) and minimal earthquake exposure.

1.2.16 **Run-off Control Systems**

1.2.16.1 The location of the TOCDF is such that it is virtually devoid of surface water features or intermittent streams.[19] The access road to the North and East acts as a barrier to divert runoff from higher elevations. Drawings TE-16-C-32, -33, -34 and EG-16-C-7402 detail the storm drainage features of the TOCDF.

1.2.17 **Proposed New and Existing Hazardous Waste Management Units**

1.2.17.1 The only waste management units in the immediate vicinity of the TOCDF plant are those units located at the facility itself and Igloos 1632 and 1634 located in Area 10, immediately adjacent to TOCDF.[20]

1.2.18 **Spill Sites**

1.2.18.1 Module VII provides information regarding spill sites.

1.3 **LOCATION INFORMATION**

1.3.1 **Seismic Standard [R315-3-2.5(b)(11), R315-8-2.9(a)]**

1.3.1.1 The DCD is located in Tooele County, which is one of the counties listed in 40 CFR 264 Appendix VI. Since the installation is located in a political jurisdiction listed in Appendix

[18] The storm water detention pond lies approximately 200 feet due west of the TOCDF as indicated on Drawing TE-16-C-3.

[19] See paragraphs 1.2.4 through 1.2.4.2 for a discussion of surface water features in Rush Valley.

[20] See Drawing TE-16-C-3.

VI, a geologic evaluation of the area has been performed in accordance with R315-3-2.5(b)(11).

1.3.1.2 Findings were presented in a report to the U.S. Army Engineering Division, Huntsville, Alabama, and the Office of the Program Manager for Chemical Demilitarization (PMCD), (which were the designated agencies in 1986). The findings of the report[21] are as follows:

1.3.1.2.1 One inferred fault occurs within a 3,000-foot radius of the site. The fault is inferred, presumably because geologic field evidence for the fault is unclear.

1.3.1.2.2 No direct geologic information is provided in geologic literature on the absolute age of the most recent fault displacement for the inferred fault.

1.3.1.2.3 Interpretation and evaluation of the available geologic literature indicate that the inferred fault could have had displacement sometime during the past 15,000 years. The Holocene epoch began 10,000 years ago.

1.3.1.3 On the basis of these findings, a geologic study was performed to:

1.3.1.3.1 evaluate geologic evidence for the inferred fault,

1.3.1.3.2 explore for other faults associated with the inferred fault in the area of the site, and,

1.3.1.3.3 obtain field data that may refine current estimates as to the age of the most recent displacement.[22]

1.3.1.4 The field study resulted in the identification of faults at three locations along a 2,250-foot-long trench. Geologic mapping of the deposits offset by the faults and development of age criteria for the deposits indicate that none of the identified faults is younger than 14,500 years. This determination is supported, in general, by the absence in the project area of land forms that are characteristic of youthful faulting. It is concluded that fault displacement has not occurred at the project site during the Holocene Epoch (i.e., the past 10,000 years), and that the site is acceptable according to 40 CFR 264 and 270 and UAC R315.

1.3.2 **Floodplain Standards [R315-3-2.5(b)(11)(iii), R315-8-2.9(b)]**

1.3.2.1 The DCD has not been mapped for the National Flood Insurance Program and thus there are no 100-year floodplain maps for the installation. However, it has been determined that the site is outside of the 100-year floodplain and is not subject to flooding, based on the following:

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[21] "Geologic Evaluation for Compliance with Seismic Location Standard 40 CFR 270.14(b)(11) for Siting a Chemical Agent Munitions Disposal System (CAMDS) at the Tooele Army Depot, South Area, Tooele County, Utah." The report is dated June 5, 1986.

[22] See, "Geologic Field Analysis for Siting a Chemical Agent Stockpile Disposal System at the Tooele Army Depot, South Area, Tooele County." The report is dated December 15, 1986.

1.3.2.2 There is no history of flooding in the area. No floods have occurred at DCD since the depot came into existence in 1942.

1.3.2.3 The overall drainage gradient for the entire TOCDF area is 1% or greater. The topography is generally smooth and uniform, allowing no chance for ponding or pooling of runoff waters. The lack of intermittent streams or defined flow paths in Rush Valley confirm the lack of flooding potential. The location of the TOCDF is such that it is virtually devoid of surface water features or intermittent streams. The closest body of surface water (i.e., 3-4 foot wide Ophir Creek) is located more than 1000 feet north of the TOCDF fence and does not appear on the topographic maps.

1.3.2.4 Drainage for the entire DCD is westerly, and the low area is more than 170 feet lower in elevation, and approximately 11 miles distant (i.e., Rush Lake) from the TOCDF.

1.3.2.5 Few well-defined natural drainage channels exist in the vicinity; there are none that would carry or direct water to or through the site.

1.3.2.6 All on-site surface runoff is collected in an underground drainage system and routed to the storm drain detention pond sized for the 100-year storm.

1.3.2.7 No significant vegetation exists to retain runoff waters.

1.3.2.8 The area is arid to semi-arid and receives little precipitation. The 100-year 24-hour precipitation event is less than 3.3 inches.

1.3.2.9 Due to local drainage at the site, the Rational Method was used to establish the 100-year frequency peak flow. The Rational Method is a simple, but accurate, hydrologic estimating technique generally used in small drainage area such as the local flow area at the TOCDF. There was no hydrologic study performed for the Rush Valley floor, given the site's history of no flooding and the relative height of the TOCDF above the valley floor. No computer modeling was performed for hydraulic analysis.

1.3.2.10 Because of the unique characteristics of each watershed in arid regions such as Utah, it would not be appropriate to predict floods from the 460-square mile Rush Valley drainage area by the Rational Method or any method other than historic records at the site. Since there is no history of flooding in Rush Valley, it is expected that the "100-year flood" would be practically insignificant. The TOCDF elevation of 100 to 200 feet above the valley floor puts it well beyond any expected flood level.

1.3.2.11 For local flooding, conservative "n" values or 0.035 were used to compute flood depths in channels. For bare earth channels, roughness would be lower, producing lower flood depths. In Rush Valley, roughness coefficient estimates were not needed because of the lack of flood potential. There are no bridges or stream channels in the vicinity of the TOCDF for analysis.

1.3.3 **On-site Drainage**

1.3.3.1 The TOCDF occupies approximately 40 acres and is largely covered by a variety of surfaces (i.e., buildings, asphalt, gravel, and concrete paving) such that runoff drains overland to the west. Runoff from the TOCDF is controlled by the slope of the asphalt

and concrete pavement towards storm drains, ditches, and culverts within the TOCDF. All on-site surface runoff is collected in an underground drainage system, which drains to the storm drain detention pond. The site has been carefully graded so that water does not run towards any building and has a generally constant gradient of greater than 1%. The 100-year, 24-hour precipitation is less than 3.3 inches and poses no flood threat to the TOCDF from local ponding.

1.3.3.2 The site access road also acts as a barrier to runoff from the north and east of the site. There is no site run off expected from any other direction. A culvert allows some drainage to flow toward the TOCDF plant site. Approximately 36 cubic feet/second of runoff will flow across the northern end of the TOCDF parallel to the existing exclusion fence. This drainage flows in a culvert where it passes under the security fence, and in an open ditch within the site. All other off-site drainage is diverted around the southern end of the site. The direction of surface water runoff flow is shown by bold arrows on the Topographic Map, TE-16-C-3 (restricted access - protected record).

1.4 TRAFFIC PATTERNS [R315-3-2.5(b)(10)]

1.4.1 General Depot Traffic

1.4.1.1 Access to the DCD is via County Road 198, connecting State Highway 73 to the Main (North) Gate, and via State Highway 73 directly connecting to the Doolittle Road and the East Gate.[23] Both State Highway 73 and County Road 198 are two-lanes, undivided, asphaltic concrete roads zoned from 55 to 65 mph. Neither highway is heavily traveled. The intersections of State Highway 73 and County Road 198 as well as the Doolittle Road with State Highway 73 are simple interchanges. Traffic control at the Highway/Doolittle interchange is via a stop sign on County Road 198. Traffic control at the Doolittle Road/Highway 73 interchange is by a stop sign on Doolittle Road.

1.4.1.2 The DCD West Gate is used at the discretion of DCD and the gate is kept locked. Access to the West Gate is via State Highway 36 onto Harrison Road. State Highway 36 is a two-lane, undivided, asphaltic concrete road. The Highway 36/Harrison Road intersection is a simple interchange with traffic control by a stop sign on Harrison Road.

1.4.1.3 The TOCDF road system consists of undivided, asphaltic concrete roads. There are no one-way streets, traffic control devices, or signs within the TOCDF. Entry to the TOCDF is controlled through the ECF. All personal vehicles are parked outside of the TOCDF and do not impact the traffic within the facility.

1.4.1.4 Generally, all traffic, including government vehicles, commercial carriers, and privately owned vehicles, follow the primary traffic route. Only security vehicles and maintenance vehicles travel off of the primary route.

1.4.1.5 As shown in Drawing TE-16-C-2, the TOCDF is immediately adjacent to and physically connected to Area 10, and therefore, the area becomes a contiguous restricted area. Consequently, there is no over-the-road transport of demilitarization items outside of this

[23] See Drawing TE-16-C-2.

area. Internal traffic movement between the storage and the demilitarization operating area is discussed in paragraph 1.4.2.

1.4.1.6 Incinerator residues are disposed of off site at an approved hazardous waste management facility. These materials are properly manifested and handled from the site to the off-site facility by a licensed transporter of such materials. Traffic patterns on site for these materials follow the primary traffic route discussed in paragraph 1.4.1.3 from the facility plants to the depot boundary. Volumes and frequency of shipments are discussed in paragraph 1.4.3.

1.4.2 **Traffic Control**

1.4.2.1 Because of the low volume of traffic at DCD, traffic control measures are simple. Speed is restricted to 30 mph unless otherwise posted (e.g., office areas and parking lots), and 45 mph is posted for most of the primary traffic route. All blind or hazardous turns are marked and posted at reduced speeds. Yield signs and stop signs control traffic at all major intersections. All railroad grade crossings are marked with signs. Traffic control enforcement is by security personnel.

1.4.3 **Estimated Volume and Frequency of Shipments**

1.4.3.1 It is estimated that 500 vehicles will pass the security gate daily. Of the estimated 500 vehicles, 10 to 15 are commercial carriers (semis or truck-trailers) traveling almost exclusively to the TOCDF area. An additional 35 to 40 vehicles (including security and maintenance) travel to other destinations throughout the DCD.

1.4.4 **Road Surfacing and Load Bearing Capacity**

1.4.4.1 Roads, parking areas, and driveways are paved. In general, all main access routes serving the TOCDF area are of asphalt. The roads have 12-foot-wide lanes with a minimum cross slope of 2 percent and 3-foot-wide dirt/gravel shoulders.

1.4.4.2 The maximum load assumed for design is the American Association of State Highway and Transportation Official's H20 loading:

1.4.4.2.1 18,000 pound axle load,

1.4.4.2.2 32,000 pound maximum axle group,

1.4.4.2.3 80,000 pound maximum vehicle weight.

1.4.5 **Restricted Area Traffic**

1.4.5.1 Total associated two-way traffic on the roads used for the transport of the PAS Brines, DFS and MPF ash, and metal residue from the facility plants to the storage area ranges between 10 to 28 vehicles per day, depending on the type of munition being processed. The truck traffic moving munitions between Area 10 and the CHB varies daily depending on the munition being processed. This estimate does not include traffic associated with Area 10 maintenance, operations, and security, which is estimated at an additional 10 vehicles per day.